

What is claimed is:

1. A method for separating sugars from a biomass hydrolyzed by an aqueous acidic solution which comprises:

providing a hydrolysis vessel for hydrolysis of a biomass, and

providing a supply of said biomass to said hydrolysis vessel, and

providing a supply of said aqueous acidic solution to said hydrolysis vessel, and

providing a phase forming vessel, and

subjecting said biomass, contained within said hydrolysis vessel, to hydrolysis by said aqueous acidic solution to form a hydrolysate containing sugars, and

withdrawing said hydrolysate from said hydrolysis vessel, and

transferring said hydrolysate to said phase forming vessel to form two phases; a sugar phase and an aqueous acidic solution phase, and

separating said sugar phase from said phase forming vessel, and

separating said aqueous acidic solution phase, from said phase forming vessel, for subsequent recycle to said hydrolysis vessel, and

withdrawing residue, remaining from hydrolysis of said biomass, containing lignins, from the hydrolysis vessel, thereby hydrolysis of a biomass forms a hydrolysate containing sugars and substantially separating the sugars from the hydrolysate and withdrawing residue remaining from hydrolysis of the biomass from the hydrolysis vessel and the hydrolysate, with sugars substantially removed, will provide recycled aqueous acidic solution to the hydrolysis vessel.

2. The method of claim 1 wherein said hydrolysis vessel is established at a predetermined temperature of about 30°C. to about 45°C. and maintained at substantially isothermal conditions.

3. The method of claim 1 wherein said phase forming vessel is established at a predetermined temperature of about 0°C. and maintained at substantially isothermal conditions.

4. The method of claim 1 wherein said biomass is selected from the group which include wood, paper and lignocellulose materials including an individual or a combination of these thereof.

5. The method of claim 1 wherein said sugars consist of the group which include glucose and pentose sugars including an individual or a combination thereof.

6. The method of claim 1 wherein said sugars are subjected to fermentation to produce ethanol.

7. The method of claim 1 wherein said hydrolysate, withdrawn from said hydrolysis vessel, is subjected to a temperature of about 0°C.

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8. The method of claim 1 wherein said hydrolysate is subjected to cooling, to produce a phase of sugars and a phase of said aqueous acidic solution.

9. The method of claim 1 wherein said residue, containing lignins, is filtered to produce filtered residue and a filtrate for recycle to the hydrolysis vessel.

10. The method of claim 8 wherein said filtered residue is subjected to extraction by water to produce water extracted residue and an aqueous extractate.

11. The method of claim 1 wherein said sugars is dissolved by an aqueous solution.

12. The method of claim 10 wherein said aqueous solution is supplied from a fermentation broth.

13. The method of claim 10 wherein said aqueous solution containing an acid is neutralized by a base or calcium carbonate.

14. The method of claim 10 wherein said aqueous solution containing an acid is neutralized by ammonia.

15. The method of claim 1 wherein said residue is subjected to filtering to produce filtered residue and a filtrate for recycle to said hydrolysis vessel.

16. The method of claim 14 wherein said filtered residue is subjected to extraction with water to form extracted residue and an extractate.

17. The method of claim 15 wherein said extractate containing an acid is neutralized by a base.

18. The method of claim 1 wherein said aqueous acidic solution contains sugars.

19. The method of claim 1 wherein said aqueous acidic solution contains about 70% sulfuric acid.